# LAKE CHAMPLAIN 2000
# STATUS OF
# AQUATIC NUISANCE SPECIES

## Final Report
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**A Report Prepared For the**
**Lake Champlain Basin Program**

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## STATUS OF AQUATIC NUISANCE SPECIES IN LAKE CHAMPLAIN

With the exception of work conducted by the Lake Champlain Zebra Mussel Monitoring Program and Aquatic Nuisance Species Control Programs for water chestnut and sea lamprey, there is little systematic data collection concerning the presence and range of aquatic nuisance species found in Lake Champlain or with the potential to invade the lake. In order to provide a comprehensive summary of the status of aquatic nuisance species in Lake Champlain, information was gathered from the following agencies, organizations, and research institutions in an effort to compile the current status of aquatic nuisance species in the lake.

Adirondack Chapter of The Nature Conservancy
Castleton State College
Darrin Fresh Water Institute at Rensselaer Polytechnical Institute (DFWI)
Ecological Interpretation Center of Mont Saint-Grégoire (CIME)
Environment Canada
Green Mountain College (GMC)
Lake Champlain Basin Program (LCBP)
Lake Champlain Maritime Museum (LCMM)
Lake Champlain Research Institute (LCRI)
Lake Champlain Sea Grant
Middlebury College
New York State Department of Environmental Conservation (NYSDEC)
New York State Museum
Quebec Ministry of Environment
University of Vermont (UVM)
United States Fish and Wildlife Service (USFWS)
Vermont Chapter of The Nature Conservancy (VTTNC)
Vermont Department of Environmental Conservation (VTDEC)
Vermont Department of Fish and Wildlife (VTDFW)
Vermont Department of Forests & Parks (VTFP)
Wildlife and Parks Quebec, Montérégie Regional Wildlife Management Division (FPQ)

The following table summarizes the status of aquatic nuisance species that are currently having an impact in Lake Champlain, and other species which have the potential to become invasive if they arrive in Lake Champlain. The information in the table was obtained from the Lake Champlain Basin Aquatic Nuisance Species Management Plan (VTDEC and NYSDEC, 2000) and from the organizations listed above.

| Aquatic Nuisance Species * | Species Impacts or Concerns | Current Status |
|---|---|---|
| Species found in Lake Champlain with a demonstrated ability to be highly invasive on a localized or widespread scale. These species are currently having economic and/or ecological impacts. | | |
| double-crested cormorant *(Phalacrocorax auritus)*[a] bird | Reduces or eliminates resources for other birds. May have negative impact on fisheries. | Widely distributed in Lake Champlain with localized nesting colonies. Populations monitored yearly on Lake Champlain islands (VTDEC, VTDFW, USFWS). Control efforts have been implemented on selected islands in Lake Champlain (VTDFW, USFWS). Nesting attempts occurred at 13 sites, 9 of which were new in 2000. Nests were destroyed or failed naturally at 12 sites. Nesting was successful at Four Brothers Islands with 1345 nests. |
| sea lamprey (*Petromyzon marinus*)[b] fish | Parasitic on other fish species. | Widely distributed in Lake Champlain. Distribution and abundance monitored for control efforts (VTDFW, NYSDEC, USFWS). NY tributaries have been treated on a revolving basis to 2000 (NYSDEC). VT streams have not been treated since 1996. |
| zebra mussel (*Dreissena polymorpha*) mollusk | Outcompetes and/or physiologically stresses native mussels. Biofouler, alters food web, bioaccumulates toxins. | Widely distributed in Lake Champlain. Distribution and abundance monitored by the Lake Champlain Zebra Mussel Monitoring Program (VTDEC). May be encountered by various studies (DFWI, UVM, LCRI, LCMM, NYSDEC). |
| Eurasian watermilfoil (*Myriophyllum spicatum* ) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Widely distributed in Lake Champlain. May be identified in infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| purple loosestrife (*Lythrum salicaria*) plant | Outcompetes native species. Able to form dense colonies. | Widely distributed in Lake Champlain wetlands. Distribution monitored by the Purple Loosestrife Biocontrol Program (VTDEC), exotic species surveys (VTTNC), identified during infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| water chestnut (*Trapa natans*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Found in southern Lake Champlain and South River, Que. near Missisquoi Bay. Distribution monitored by the Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC) and volunteer survey and eradication activities (VTTNC, CIME). |
| Species found in Lake Champlain and considered to have the potential to be invasive on a localized or widespread scale. | | |
| mute swan (*Cygnus olor*) bird | Outcompetes native species. Aggressive nesting behavior. | Occasionally found on Lake Champlain. Controlled by VTDFW when sighted. |
| common carp (*Cyprinus carpio*) fish | Degrades shallow water habitats. Linked to declines in waterfowl and some native fish species. | Found throughout Lake Champlain. May be encountered in fish monitoring efforts (LCRI, USFWS, UVM,VTDEC, VTDFW). |

| Aquatic Nuisance Species * | Species Impacts or Concerns | Current Status |
|---|---|---|
| Species found in Lake Champlain and considered to have the potential to be invasive on a localized or widespread scale (cont.). | | |
| gizzard shad (*Dorosoma cepedianum*) fish | Outcompetes native species. Poor nutritional value to gamefish. Adult size makes them unsuitable as forage fish. | Found mainly in southern Lake Champlain and recently found in Burlington Bay (UVM). May be encountered by other fish monitoring efforts (LCRI, VTDEC, VTDFW, USFWS). |
| white perch (*Morone americana*) fish | Outcompetes native species. | Common in southern Lake Champlain, but found throughout the lake. May be encountered in fish monitoring efforts (LCRI, UVM, VTDEC, VTDFW, USFWS). |
| blueback herring (*Alosa aestivalis*) fish | Outcompetes native species. Poor nutritional value to gamefish. | Found occasionally but not well established in Lake Champlain. First reported in Lake Champlain in the late 1970's. May be encountered in fish monitoring efforts (LCRI, UVM, VTDEC, VTDFW, USFWS). |
| brook silverside (*Labidesthes sicculus*) fish | Unknown | Recently found off Alburg, Grand Isle, Milton and Poultney River (UVM, VTDEC, VTDFW). May be encountered in fish monitoring efforts (LCRI, UVM, VTDEC, VTDFW, USFWS). |
| European rudd (*Scardinius erythrophthalmus*) fish | Displaces native forage fish. Able to hybridize with golden shiners. | First sighted in Lake Champlain in 1991 but only found off South Hero (VTDFW). Does not appear to be spreading. May be encountered in fish monitoring efforts (LCRI, UVM, VTDEC, VTDFW, USFWS). |
| goldfish *(Carassius auratus)* fish | Degrades shallow water habitats. | Reported in Lake Champlain and tributaries (Jewett Brook, St. Albans Town, and Englesby Brook, So. Burlington). Also found in ornamental ponds in VT and NY. May be encountered in fish monitoring efforts (LCRI, UVM, VTDEC, VTDFW, USFWS). |
| mud bythinia (*Bythinia tentaculata*) mollusk | May outcompete native species, biofouler. | Found throughout Lake Champlain. Individuals noted by the Zebra Mussel Monitoring Program (VTDEC), by the Shale Cobble Survey of Macroinvertebrates (VTDEC0) and UVM studies. May be encountered in LCRI studies. |
| banded mystery snail *(Viviparus georgianus)* mollusk | Unknown | Native to North America east of the Mississippi River but suspected range expansion to Lake Champlain. Noted in Lake Champlain in 1995 by the Shale Cobble Survey of Macroinvertebrates (VTDEC). May be encountered by the Zebra Mussel Monitoring Program (VTDEC), UVM studies, or LCRI studies. |
| big-ear radix *(Radix auricularia)* mollusk | Unknown | Recently rediscovered in Grand Isle by the Zebra Mussel Monitoring Program (VTDEC) and UVM studies. |

| Aquatic Nuisance Species * | Species Impacts or Concerns | Current Status |
|---|---|---|
| Species found in Lake Champlain and considered to have the potential to be invasive on a localized or widespread scale (cont.). | | |
| European frog's bit (*Hydrocharis morsus-ranae*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Small populations in southern Lake Champlain, Grand Isle, and Scomotion Creek in Plattsburgh, NY. Distribution noted by the Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), identified during infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| flowering rush (*Butomus umbellatus*) plant | Outcompetes native species. Able to form dense colonies. | Found in southern Lake Champlain. Distribution noted by the Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), identified during infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| yellow flag iris (*Iris pseudacorus*) plant | Outcompetes native species. Able to form dense colonies. | Found in Lake Champlain wetlands. May be encountered during infrequent plant monitoring efforts (VTDEC), surveys by the Nongame & Natural Heritage Program (VTDFW) or as a result of lake user reports (LCBP). |
| yellow floating heart (*Nymphoides peltata*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Small populations in southern Lake Champlain and Lake Champlain wetlands. Distribution noted by the Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), identified during infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| common reed (*Phragmites australis*) plant | Outcompetes native species. Able to form dense colonies. | Found in Lake Champlain wetlands. May be encountered during infrequent plant monitoring efforts (VTDEC), surveys by the Nongame & Natural Heritage Program (VTDFW) or as a result of lake user reports (LCBP). |
| curly leaf pondweed (*Potamogeton crispus*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Widely distributed in Lake Champlain. Identified during infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| Species not known to be present in Lake Champlain, but with the potential to become invasive if/when they arrive. | | |
| rusty crayfish (*Orconectes rusticus*) crustacean | Outcompetes native species. | Found in Lake Carmi, and the lower Winooski River, VT. May be encountered by the Biological and Aquatic Studies Section (VTDEC), Zebra Mussel Monitoring Program (VTDEC), UVM studies, or LCRI studies. |
| alewife (*Alosa pseudoharengus*) fish | Outcompetes native species. Poor nutritional value to gamefish. | Research by GMC found juveniles and larvae have escaped Lake St. Catherine, VT. Has not yet been identified in Lake Champlain by the Larval Alewife Sampling Program (VTDFW). May be encountered by other fish monitoring efforts (LCRI, USFWS, UVM). |
| Eurasian ruffe (*Gymnocephalus cernuus*) fish | Outcompetes native species. | Closest known locations in MI and Ont. May be encountered in fish monitoring efforts (LCRI, UVM, VTDFW, USFWS). |

| Aquatic Nuisance Species * | Species Impacts or Concerns | Current Status |
|---|---|---|
| Species not known to be present in Lake Champlain, but with the potential to become invasive if/when they arrive (cont.). | | |
| round goby (*Neogobius melanostomus*) fish | Outcompetes native species. Molluscivore, aggressive spawning behavior, bioaccumulates toxins. | Closest known location in NY. May be encountered in fish monitoring efforts (LCRI, UVM, VTDFW, USFWS). |
| tubenose goby (*Proterothinus marmoratus*) fish | Outcompetes native species. | Closest known location in Lake Erie. May be encountered in fish monitoring efforts (LCRI, UVM, VTDFW, USFWS). |
| tench *(Tinca tinca*) fish | Degrades shallow water habitats. Outcompetes native species. | Closest known location in Richelieu River, Que. May be encountered in fish monitoring efforts (FPQ, LCRI, UVM, VTDFW, USFWS). |
| Asiatic clam (*Corbicula fluminea*) mollusk | Outcompetes native mussels. Biofouler, bioaccumulates toxins. | Closest known location in NY and MA. May be detected by UVM studies, LCRI studies, native mussel surveys (VTDEC, USFWS) or the continuation of the Shale Cobble Macroinvertebrate Survey (VTDEC). |
| quagga mussel (*Dreissena bugensis*) mollusk | Outcompetes native mussels. Biofouler, alters food web, bioaccumulates toxins. | Closest known location in NY and Que. May be encountered by the Zebra Mussel Monitoring Program (VTDEC), UVM studies, LCRI studies, native mussel surveys (VTDEC, USFWS), the continuation of the Shale Cobble Macroinvertebrate Surveys (VTDEC) or the LCMM. |
| Chinese mystery snail (*Cipangopaludina chinensis*) mollusk | Forms dense colonies. | Common in the Connecticut River (VT, NH). May be detected by the Biological and Aquatic Studies Section (VTDEC), Zebra Mussel Monitoring Program (VTDEC), UVM studies, or LCRI studies. |
| fanwort (*Cabomba caroliniana*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Closest known location in MA, NH and NY. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| Brazilian elodea (*Egeria densa*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Closest known location in MA and NY. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |

| Aquatic Nuisance Species * | Species Impacts or Concerns | Current Status |
|---|---|---|
| Species not known to be present in Lake Champlain, but with the potential to become invasive if/when they arrive (cont.). | | |
| hydrilla (*Hydrilla verticillata*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Closest known location in CT. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| slender-leaved naiad (*Najas minor*) plant | Outcompetes native species. Able to form dense colonies, restricting boat traffic. | Found in Lake Bomoseen and Sunrise Lake (VT), but is not considered a nuisance at these locations. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| parrot's feather (*Myriophyllum aquaticum*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Closest known location in MA and NY. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| variable-leaved watermilfoil (*Myriophyllum heterophyllum*) plant | Outcompetes native species. Able to form dense colonies, restricting navigation and water-based recreation. | Closest known location in MA and NH. May be detected by Water Chestnut Management Program (VTDEC), exotic species surveys (VTTNC), infrequent plant monitoring efforts (VTDEC) or as a result of lake user reports (LCBP). |
| spiny water flea (*Bythotrephes cederstroemi*) zooplankton | Fouls fishing tackle. Spines reduce small fish predation. | Closest known location in NY. May be detected in plankton samples collected by the Zebra Mussel Monitoring Program (VTDEC), the Lake Champlain Long-Term Water Quality and Biological Monitoring Program (NYSDEC), UVM studies or LCRI studies. |
| fishhook water flea (*Cercopagis pengoi*) zooplankton | Fouls fishing tackle. Spines reduce small fish predation. | Closest known location in NY. May be detected in plankton samples collected by the Zebra Mussel Monitoring Program (VTDEC), the Lake Champlain Long-Term Water Quality and Biological Monitoring Program (NYSDEC), UVM studies or LCRI studies. |
| Lumholtzi water flea (*Daphnia lumholtzi*) zooplankton | Outcompetes native species. Spines reduce small fish predation. | Closest known location in OH. May be detected in plankton samples collected by the Zebra Mussel Monitoring Program (VTDEC), the Lake Champlain Long-Term Water Quality and Biological Monitoring Program (NYSDEC), UVM studies or LCRI studies. |

* = According to the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (P.L. 101-646, 1990, amended 1996) an aquatic nuisance species is defined as "a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters."

a = Historically the double crested cormorant was considered an infrequent visitor to the Champlain Basin.

b = Some scientists believe that the sea lamprey may be native to Lake Champlain. Those who favor the exotic status cite that the sea lamprey was not identified in Lake Champlain prior to 1929 pointing to the Champlain Canal as a probable invasion route.